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(54)[TITLE OF THE INVENTION] Manufacturing method of lightweight cement plate

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**[SPECIFICATION]**

5 **[TITLE OF THE INVENTION]** Manufacturing method of lightweight cement plate

**[CLAIMS]**

(1) Calcium-silicate gel is provided, this, cement, fiber material, and water are mixed and make slurry, form sheet this slurry by sheet forming machine, build  
10 plate-shaped object, and cure and stiffen this.

Manufacturing method of lightweight cement plate characterized by the above-mentioned.

(2) Manufacturing method of lightweight cement plate given in the 1st claim said given sheet forming machine is round-net type sheet forming machine.

15 (3) Manufacturing method of lightweight cement plate given in the 1st claim said given curing is wet-heat curing or autoclave curing.

**[DETAILED DESCRIPTION OF THE INVENTION]** This invention relates to manufacturing method of lightweight cement plate.

20 Conventionally, lightweight cement plate was manufactured by the following method.

That is, 1st method distributes lightweight aggregate in cement slurry.

Lightweight cement plate is manufactured by casting this.

25 This method had disadvantage that and mass-production property was bad and strength of manufactured lightweight cement plate became smaller by lightweight aggregate in order to manufacture lightweight cement plate by casting.

2nd method mixes with foaming agent into cement slurry, and manufactures lightweight cement plate by casting this.

30 In order that this method might also use casting method, there was disadvantage that manufactured lightweight cement had small strength because of many gas bubbles dispersed in cement layer, also bad mass-production property.

35 Therefore, objective of this invention is providing manufacturing method of lightweight cement plate which can mass-produce lightweight cement plate with large strength.

40 Characteristics of this invention provide calcium-silicate gel, this, cement, fiber material, and water are mixed, slurry is made, this slurry is made sheet by sheet forming machine, plate-shaped object is made, and it is in curing and stiffening this.

That is, calcium-silicate gel, since apparent specific gravity is small (bulky) and specific surface area and cohesion are large, familiarity with cement particles is good and cement particle tenacity is large.

45 Therefore, cement particles are sufficiently maintained in slurry, and it is not based on casting, but comes to be able to perform continuous sheet forming by sheet forming machine by adding this.

Moreover, since calcium-silicate gel is high strength, strength of lightweight

obtained.

Moreover, unreacted  $\text{SiO}_2$  in calcium-silicate gel is by curing hardening, reacts to  $\text{Ca}(\text{OH})_2$  which precipitates at the time of cement hardening.

Therefore, strength of lightweight cement plate becomes higher further.

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**[EXAMPLE 1-5]** : Diatom earth was mixed with lime at ratio of 1/1 by molar ratio, water was added, it stir-mixed under 80-degree C wet heat for 10 hours, and calcium-silicate gel was obtained.

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This calcium-silicate gel (dry basis), cement, and fiber material were mixed at ratio of degree table, sheet forming plate manufacture was carried out by method (Hatscheck method) of using usual round-net type sheet forming machine, curing hardening of this was carried out on conditions shown in degree table, and lightweight cement plate was obtained.

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**[COMPARATIVE EXAMPLE 1]** : Carry out plate manufacture by the casting dehydrating method the next blending using lightweight aggregate, this was cured on condition of degree table, and lightweight cement plate was obtained.

Cement: 100 parts (basis of weight, the following is same)

Lightweight aggregate (Mitsui pearlite): 300 parts

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Asbestos (Canada cotton 5class): 40 parts

**[COMPARATIVE EXAMPLE 2]** Using Al powder as a foam agent, by the next blending, by casting method, plate manufacture was carried out, this was cured on condition of following Table, and lightweight cement plate was obtained.

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Cement: 100 parts

Foaming agent (Al powder): 1 part

Asbestos (Canada cotton 5class): 10 parts

Water: 70 parts

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The physical property of lightweight cement plate obtained by the above Example and Comparative Example is shown in following Table.  
Following margin

		実例	実例	実例	実例	実例	比較例	比較例
		1	2	3	4	5	1	2
配合 (重量部)	セメント	100	100	100	100	100	100	100
	ケイ酸カルシウムゲル	100	20	100	100	100	—	—
	アスベスト (カナダ5class)	20	12	20	20	20	40	10
	パルプ	2	2	2	2	2	—	—
	耐アルカリガラス繊維 (ピルキントン社製)	—	—	3	—	—	—	—
	軽量骨材	—	—	—	—	—	300	—
養生法	A 粉末	—	—	—	—	—	—	1
		湿空 (25℃) 28日間	同左	同左	湿熱 (80℃) 10時間	オートクレーブ (105℃ 180℃) 10時間	湿空 (25℃) 28日間	湿空 (25℃) 28日間
物性	比重	1.1	1.5	1.1	1.0	1.0	1.0	1.3
	曲げ強度 (kg/cm)	140	200	250	150	160	100	85
	吸水率(%)	25	20	25	20	20	25	35

First row (left to right): Example 1,2,3,4,5, Comparative Example 1,2

- 5 First column (top to bottom): Blending (weight-part) ; Cement, Calcium-silicate gel, Asbestos (Canada 5class), Pulp, Alkali resisting glass fiber (Made by Pilkington), Lightweight aggregate, Al powder, Curing method, Physical property ; Specific gravity, Bending strength (kg/cm), Coefficient of water absorption,
- 10
- 15 9<sup>th</sup> row (row of Curing method): Moist air (25 degrees C) 28 days, The same left, The same left, Wet-heat (80 degrees C) 10 hours, Autoclave (10 barometric pressure, 180 degrees C) 10 hours, Moist air (25 degrees C) 28 days, Moist air (25 degrees C) 28 days,

In addition, in table, coefficient of water absorption shows result of 24-hour water absorption.

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